

Learning Lessons



Urban Water Supply Sector

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Foreword

Learning lessons from evaluation is part of good corporate governance. To ensure that it invests responsibly, the Asian Development Bank (ADB) continually reviews its operations to assess their effectiveness, learn from experience, and improve the development of future policies, strategies, programs, and projects. Learning lessons from evaluations contributes to achieving development effectiveness of ADB operations by providing feedback on performance.

This online edition of learning lessons on Urban Water Supply Sector complements ADB's *Guidance Note on Urban Water Supply Sector Risk Assessment*. A joint knowledge product of ADB's Governance and Water Communities of Practice, the Guidance Note offers a framework for mapping governance risks to inform the preparation of future country partnership strategies. Such a framework covers institutional aspects (policy, legal framework, and regulation); organizational aspects (planning, financial management, procurement, and human resources); and sector operations. While the Guidance Note has identified entry points for mapping risks to development effectiveness in the sector, lessons from evaluations can augment ongoing efforts for mitigating these risks at institutional, organizational, operational, and project levels; and enhance the development effectiveness of ADB assistance in the sector. These lessons are drawn from actual independent evaluations, self-evaluations (project and/or program completion reports), and the Evaluation Information System. They are intended to be illustrative and not meant to be prescriptive or interpreted as recommendations. Users of this brief are advised to review these lessons carefully in the context of the conditions and operating environments where they actually encounter them to broaden their understanding of past ADB experiences, and to utilize them in current and future challenges in the sector. The challenges and solutions cannot be generalized as they are typically different from one scenario to another given the country and sector contexts.

This final output is a result of collaboration among individuals from communities of practice and departments in ADB, to promote learning lessons from evaluations. A team from the Independent Evaluation Department (IED) and the Public Management, Governance, and Participation Division (RSGP) of the Regional and Sustainable Development Department initiated this learning lessons series. The team comprised Njoman Bestari (advisor), Jocelyn Tubadeza (evaluation specialist, operations coordination), Sergio Villena (research associate, consultant) and Mike Diza (associate knowledge management administrator) from IED; and Sandra Nicoll (director), Brenda Katon (governance specialist, consultant), and Jessica Ludwig-Maaroof (public management specialist) from RSGP. Licel Calderon provided administrative support to the team. ADB's governance and water practice leaders provided input and suggestions during

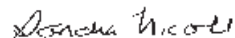
the preparation of these lessons. Other reviewers included Anand Chiplunkar, Laure Darcy, Juana Dimayuga, Jingmin Huang, Jon Lindborg, Vijay Padmanabhan, Supriya Sen, and Tomoo Ueda. Their inputs are truly appreciated.



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Abbreviations

| | | |
|-----|---|-----------------------------------|
| ADB | – | Asian Development Bank |
| CBO | – | community-based organization |
| DMC | – | developing member country |
| IED | – | Independent Evaluation Department |
| NGO | – | nongovernment organization |
| O&M | – | operations and maintenance |
| PPP | – | public–private partnership |
| TA | – | technical assistance |
| WSS | – | water supply and sanitation |

Background

The ADB *Guidance Note on Urban Water Supply Sector Risk Assessment*, published in November 2009 (hereafter referred to as the “Guidance Note”), outlined sector risks that can reduce development effectiveness in the urban water supply sector.¹ The sector risks were classified within the frameworks of

- (i) institutional features (policy, legal framework, and regulation);
- (ii) organizational aspects (planning, financial management, procurement, and human resources); and
- (iii) operations (water harvesting and storage, water treatment, distribution, and customer interface).

The Guidance Note indicated that the urban water supply sector is vulnerable to various risks due to several factors. These include the following: (i) involvement of multiple institutions in water governance, (ii) capital intensity, (iii) large-scale procurement, (iv) interface between public and private sectors, (v) political pressure on tariffs, (vi) high demand for water services, (vii) water scarcity (and becoming more so due to population growth and resource depletion), (viii) dispersed service provision, and (ix) weak institutional capacity. Vulnerabilities exist in policy making, regulation, organizational management, and operations.

The Guidance Note sought to increase awareness of risks that can reduce the benefits from operations and curtail development effectiveness in the urban water supply sector. This series of learning lessons complements the Guidance Note—by providing relevant lessons and their contexts drawn from independent evaluations and self-evaluations (project completion reports) of ADB assistance in the urban water supply sector over the last 10 years. The analysis of a wide array of lessons may also provide an expanded perspective of the sector risks encountered by ADB-assisted programs and projects.

Key Lessons and Contextual Sector Risks

Institutional Risks

Policy

Vested political and business interests that influence and distract the focus of policy and investment priorities can undermine sector responsiveness to actual needs. Since policy change takes time to be accepted in an established bureaucracy, a more careful assessment of the political risks that may inhibit reform progress is needed. Government leadership is critical in the policy formulation and consultation processes. More upfront consultations with key officials, stakeholders, and the public should be done to ensure effective communications and change management, transparency, and accountability. A more process-oriented methodology may also be considered, where policy reforms are developed in a systematic manner, enabling wider consultations to ensure acceptance by all stakeholders. Government leadership is critical in the policy formulation and consultation process.²

Unclear or undefined targets, approaches, and result indicators weaken the effectiveness of policy reforms. The effectiveness of policies is normally measured against outcome objectives. Therefore, it is imperative that policy reform programs be accompanied with clearly targeted results, well-defined approaches, the required resources, as well as result indicators that will be used for output and/or outcome assessments during and after implementation.³

Limited conduct of policy discussions and dialogues among major stakeholders can weaken the impact of water supply sector policy reforms and/or changes. In mitigating this risk—as in the case of the Chonburi Water Supply Project in Thailand—policy dialogues between ADB, the government, and the executing agency, in the context of an ADB-funded technical assistance, contributed to institutional development and policy reform. These efforts strengthened the executing agency’s operations, accelerated the privatization of water supply operations, and facilitated the establishment of a regulatory body.⁴

Regulation

Regulation is one of the key governance issues in urban water supply. ADB recognizes that the setting up of an independent regulator is desirable but it may pose serious challenges when there are vested interests and there is fear of losing control among the parties involved. The presence of an independent regulator needs to be accompanied with a clear mandate, adequate skills, and resources. A credible regulator needs to demonstrate characteristics that encompass neutrality, efficiency, accountability, and transparency. The regulatory environment is equally applicable to public and private sectors.

Inadequate management and lack of financial autonomy can undermine the work of an independent sector regulator. As experienced by projects covered by an evaluation of ADB assistance to water supply services in Metro Manila, the regulatory office should be fully autonomous to ensure its independence and to avoid the risk of political pressure.⁵ For example, two reports emphasized the need to have regulatory capacity of sector institutions. Improved regulatory capacity should ensure a level playing field for utility companies that provide services in urban areas while financial independence grants autonomy to the regulator in setting water tariffs to meet the financial requirements and sustainability of these concerned entities.⁶

Partnerships and Networks

Poor coordination with development partners and lack of harmonization of interventions can lead to inefficient use of resources and suboptimal outcomes and impacts. The impact evaluation study of rural water supply in Pakistan⁷ underscored the need for ADB to cooperate proactively with development partners to ensure achievement of expected outcomes and impacts from water supply and sanitation (WSS) interventions, which may include

- (i) creating demand for sanitation investment;
- (ii) improving the delivery of safe water;
- (iii) strengthening the institutional capacity of community-based organizations (CBOs), nongovernment organizations (NGOs), and the private sector;
- (iv) strengthening institutional incentive structure for the effective management of WSS services;
- (v) undertaking water demand analysis and water resource mapping;
- (vi) putting in place water use regulations; and
- (vii) ensuring the efficient use of resources without duplication of efforts.

Lack of incentives and an unclear framework for private sector participation in urban water supply services can discourage new players from bringing in much-needed resources to the sector. Private sector participation should be encouraged, and arrangements for such participation should include incentives and assurances of a reasonable rate of return within a specified time frame. This entails full knowledge of investment and business issues, including legal and transaction advisories that are very much needed.⁸ For example, based on the evaluation of ADB assistance to water supply services in Metro Manila, private sector participation in metropolitan waterworks and sewerage system operations has brought benefits to locations where water connections were put in place and water supplied. Several design lessons for water concession were noted, as follows:

- (i) concession agreements and contracts need to include technical and financial specifications on the concessionaire's performance including nonrevenue water reduction, new investments, and tariff flexibility;
- (ii) mechanisms are needed for holding water concession designers accountable for specified arrangements;
- (iii) as concession arrangements were difficult to adjust after the initial agreement, more flexible yet robust terms are needed where justified;
- (iv) adequate separation of policy, regulation, and operations, including independent and effective regulation, is essential; and
- (v) strong and consistent political leadership is required for successful water concessions.⁹

Public-private partnerships (PPPs) are not a universal solution to underlying sector investment and performance problems.¹⁰ The costs and benefits associated with traditional public sector procurement and the use of PPP modalities have to be clearly established through public comparator and value for money analyses. PPPs require sustained policy dialogue and support to develop suitable legal, regulatory, and institutional frameworks and assistance in the development of PPP pathfinder projects. Private sector participation is not a substitute for reform or government effort. On the contrary, many PPP modalities require prior sector restructuring and tariff reforms to be effective. Also, the use of PPPs on a larger scale requires substantial investment by the government in project identification and development, regulation, and monitoring of PPP contracts. Support for policy reforms, capacity development, and pilot transactions can often proceed together, in parallel. Hands-on experiences gained in developing and negotiating PPP pilot projects can serve as valuable inputs to the development of PPP policy frameworks. A decision on whether to support overall or sector-based institutional and legal frameworks for PPP should consider country conditions. PPP modalities have to be carefully chosen to address identified sector development needs. Overall system efficiencies should be considered in network-dependent infrastructure, particularly in the water sector.

Inadequate understanding of the complexities of privatization and corporatization of public water utilities can impair their successful implementation. Decisions to privatize are often due to the need to finance large investments and increase reliability and accountability in the sector.¹¹ Examples of well-functioning public utilities, however, indicate that private ownership is not a precondition for efficient operations. Corporate structure (ownership) has been found important in defining the identity of utilities and helping develop corporate goals, governance, and institutional culture.¹² Moreover, instilling a drive to generate revenue and minimize costs (commercialization) is crucial because commercialization is not an automatic offshoot of changes in the corporate structure. Making corporate performance transparent and increasing public awareness of the financial and operational implications of the status of water utilities is also important. In the case of one developing member country (DMC), corporatization did not succeed because it was equated with privatization, rather than with providing a service of acceptable quality and minimizing losses from a valuable natural resource.

Failure to identify and partner with existing organizations and/or institutions with credible experience in the water supply sector in the project area can compromise or undermine effective implementation and resource-optimization opportunities. NGOs and private sector entities can be effective partners of the government and the communities in implementing community-managed WSS projects by providing technical and institutional assistance.¹³ Credible NGOs are capable of conducting socioeconomic surveys and information campaigns more effectively than conventional consultants.¹⁴

Unclear functional relationships and lack of cooperation among key stakeholders may expose water supply interventions to vulnerabilities during implementation and operations. There is a need for clear and close functional relationships and collaborations at all levels among key stakeholders, such as CBOs, NGOs, and the public and private sector entities.¹⁵ Roles, functions, and responsibilities need to be clarified and differentiated for project implementation and during operations and maintenance (O&M). A single agency trying to do all activities runs the risk of noncooperation from other agencies, particularly after project completion and/or after external funding has ceased, and when O&M needs to be fully in place. This risk can be mitigated by strengthening CBOs, NGOs, and public and private sector

entities to take on assigned roles and responsibilities commensurate with their capabilities. For example, local institutions or local governments need to develop adequate capacity for human resources development to take over delegated, decentralized, or co-managed responsibilities from national or provincial agencies and/or governments. While this lesson may sound overly simplistic, effective implementation and O&M require clearly delineated roles, effectively assigned responsibilities, and established capacities to perform these roles.

Organizational Risks

Planning

Limited capacity for informed participation by customer groups, industry and professional associations, and other civil society organizations in sector planning processes can weaken responsiveness of sector plans. Water connection programs should be associated with community education and awareness programs to improve understanding of the (i) project benefits and value of the programs—explained in understandable terms to stakeholders and beneficiaries, (ii) availability of lifeline water supply, (iii) payment methods, (iv) customers' obligations, and (v) penalties on illegal connection. Customers should not only be made aware of what services they should expect and demand from utilities, but they should also know their obligations. They should understand that unless they fulfill their obligations, such as paying tariff and paying on time, the services run the risk of not being sustained. Likewise, water supply companies and local government executives should be aware of their obligations in achieving output targets and meeting financial covenants.¹⁶

Lack of adequate consultation with and participation of end users and other stakeholders can weaken the impacts of water supply projects. Inadequate consultation with end users and other stakeholders at project preparatory and design stages can reduce the impacts of projects. Consultations that cover the type and level of proposed facilities, size, costs involved, probable tariffs, affordability, and willingness to pay are vital for the sustainability of projects.¹⁷ Early involvement of end users, beneficiaries and/or communities in water supply projects and clarity of the roles of contractors and water supply companies (who will be responsible for the repayment of loans) can help mitigate the above risk.¹⁸ However, the level and extent of community consultations can vary significantly, taking into account the types of water supply systems that are being designed and implemented.

Inadequate knowledge of local conditions and culture and/or norms can have adverse impacts on the quality of project design and implementation. Two completion reports—one performance evaluation report and one sector paper—considered the understanding of (i) local conditions, (ii) the operational setup of the utilities concerned, and (iii) the cultural environment in which the project will operate as vital to project design and implementation.¹⁹

Water Management

Weak organizational capacity of any of the key stakeholders can have direct and adverse impacts on the implementation and success of urban water supply projects. Institutional strengthening and training activities figure prominently in successful WSS projects. Training activities must not be limited to human resource development but also focus on technical and engineering aspects of the projects, water supply systems survey and design, appraisal

techniques, and construction supervision and management.²⁰ Three project completion reports cited the importance of training the government project staff on ADB guidelines and procedures prior to project implementation. This is particularly relevant when the executing agency has no prior experience in the administration and implementation of ADB-financed projects.²¹ Ongoing capacity development efforts need to include technical aspects of O&M as well as financial management, water demand management through public awareness campaigns, protection of water sources, and water conservation.²² As seen in the impact evaluation study on WSS projects in selected DMCs, significant implementation delays were the result of an interplay of institutional, design, policy, and administrative factors that include among others, institutional and capacity constraints commonly encountered in DMCs.²³ Inadequate local government capacity can act as a serious impediment to the collection of timely and accurate data.²⁴

Inadequate information on water resource use and other aspects (e.g., water quality and water supply inventory) can impair water resource planning and management. A comprehensive management information system can help improve water operations and management. As illustrated in one case, for the management information system to be useful and effective, its operational data and performance indicators should be accurate and used by managers in making necessary adjustments in O&M, connection programs, and local administration.²⁵ A good information system can help promote an integrated approach to water resources management by providing reliable information as basis for a justified water allocation system for all competing uses. An assessment of available water resources (groundwater or surface water) can help determine the volume of available water needed to meet the urban water supply requirements.

Financial Management

Inadequate revenue streams to cover O&M costs, depreciation, and returns on invested capital can lead to poor service quality and undermine new investments. Long-term sustainability of water supply services depends largely on financial sustainability, including the implementation of an appropriate tariff policy, tariff, or revenue collection scheme to cover O&M costs, debt service, as well as cost recovery for new development to meet rising demand.²⁶ As illustrated in three project completion reports, failure to enact tariff policies, increase and/or adjust tariffs to meet targets for cost recovery, and to remediate weak implementation of tariff policies could significantly jeopardize financial sustainability.²⁷

Two project performance evaluation reports confirmed the willingness of consumers to pay higher tariffs if water supply services are adequate and reliable.²⁸ Still, the majority of consumers view water supply and its cost purely from a “lowest tariff” perspective, i.e., tariff levels that cover O&M but not enough to expand or improve on water supply services.²⁹ There is, therefore, a need to promote greater awareness, not only of water resource management and operational matters, but also of financial issues such as periodic adjustments of tariff schedules for cost recovery.³⁰

Inappropriate financing mechanisms for urban sector infrastructure, such as WSS facilities, discourage cities and towns to aspire for financial accountability and fiscal sustainability. The combined approach of concessionary lending and grant provision to the urban sector may be calibrated appropriately, and the amount of lending to cities and towns should be stepped up gradually to keep pace with urban growth. This approach may increase its impact on urban poverty and the environment. This is consistent with the objective of promoting

financial accountability and creating fiscally sustainable cities and/or municipalities. Experience in Bangladesh, for example, shows that grant financing of infrastructure causes a dependency in institutions and municipalities that is not conducive to the development of adequate cost recovery mechanisms for service provision. Grant financing can diminish the drive to seek local and more commercial sources of municipal finance. Thus, development partners should analyze those financing mechanisms that engender greater municipal accountability, as well as promote local resource mobilization to ensure long-term sustainability of WSS projects. This approach may involve a financing plan consisting of loans and grants in proportions that are determined by the revenue-generating potential of the WSS projects and their financial sustainability, thereby emphasizing greater cost recovery for projects that are burdened with debt service including loan repayments.³¹

Inability of water supply companies to improve their financial performance imperils the long-term sustainability of their operations. To be able to raise funds, water supply companies must aim to become better-managed and technically more efficient institutions through necessary reforms. They must guide their financial performance so that they can meet cost recovery targets, including debt service payments.³² Challenges in achieving full cost recovery are enormous, while tariff setting is dependent on many factors. Financial sustainability is a key issue, and water tariffs should at least meet full O&M costs.

Failure to identify and establish financial mechanisms to support revenue streams constricts the flow of water project benefits. Financial viability is an important key to sustainability so that O&M, routine and periodic maintenance, and capital replacement costs can be met or funded. Sustained operations will allow the continuous flow of project benefits during the expected lifecycle of the project investments. However, in many instances, user charges barely or seldom meet the O&M and capital replacement costs. A financial back-up mechanism, therefore, is needed to bridge O&M financing deficit, which may come from regular budgetary support or other sources.³³

Procurement

Large capital projects present opportunities for large-scale procurement, which may be vulnerable to leakages unless transparent procurement processes are in place. Each procurement project should be packaged in such size so that bidding will be competitive among qualified contractors. Rightsizing the number of contract packages will also lessen the executing agency's workload for controlling and supervising contractors and suppliers.³⁴

Limited information on existing procurement regulations and practices in DMCs can disrupt project implementation schedules. Up-front assessment of available procurement regulations and compliance with good procurement practices can help avoid delays in project implementation. The comprehensive procurement plan for new projects should reflect this assessment and use it in monitoring project implementation.³⁵

Unclear specifications in bidding documents may lead contractors to submit extremely diverse bids. This diversity will be difficult to assess during bid evaluation and may also be difficult to supervise during implementation. Bidding specifications should be explicit, and provided with specific values and quantities that the contractors shall follow, to facilitate the executing agency's supervision of the contracted works.³⁶

Financially weak contractors may deliver substandard outputs or services, or may not deliver the outputs or services at all. To avoid engaging financially weak contractors, more stringent evaluation of their financial capacity is necessary during bid evaluation. The executing agency may consider increasing the percentage of performance security from the current 10% to discourage financially weak contractors from submitting bids.³⁷

Operations

Water Harvesting and Storage

Poor management of water reservoir leads to inefficient and unreliable water supply. Poor supply management in the context of increasing demand for water can cause customer dissatisfaction. An effective demand-side management program could be a simple and cost-effective alternative to supply expansion, particularly in water-scarce areas. For example, a demand-side management can succeed—with political support and appropriate campaigns—in promoting customer awareness of the need for water conservation, as observed in Dalian in the People’s Republic of China.³⁸

Poor assessment of water resources leads to underutilization of water reservoirs. Proper assessment of water resources should be the basis for supplying water. For example, in Kupang, Indonesia, improper assessment led to underutilization of several water reservoirs.³⁹ Some reservoirs in Kupang were being used far below their capacity due to overestimation of aquifer yields, resulting in the reservoir’s excessive oversizing and bore wells producing much less water than intended.

Distribution

Failure by water suppliers to provide alternative ways of delivering potable water (other than piped water supply) deprives consumers of ready access to water supply. According to an impact evaluation study on WSS projects in selected DMCs, although drinking water requirements amount to 2–3 liters per capita per day, they do not have to be met only through a piped water supply. Potable water from water treatment plants, as well as smaller quantities from shallow groundwater, may be better delivered when distributed in bottles, either by the water supply company or through a PPP. Most DMCs in tropical areas are endowed with sufficient annual rainfall, hence, shallow groundwater is the most accessible and sustainable source of potable water.⁴⁰

Although nonrevenue water has been reduced in some water supply systems, high, nonrevenue water levels persist in many countries. Poor management of nonrevenue water distribution can lead to high losses. Nonrevenue water has obvious financial implications, especially if unchecked, as it represents lost revenue. Measures to reduce losses may include improving maintenance, metering, and reducing leaks and thefts. As revenue is a function of volume sold and price, water tariff is one of the factors that influence how much effort should be put into reducing nonrevenue water. Assuming that demand for the water exists, the revenues gained from water saved can be reinvested to cover the costs of reducing nonrevenue water. Where the tariff is low, the cost per unit reduction in nonrevenue water may be significant compared with the revenues gained.⁴¹

Local elite influence over water supply and distribution services can lead to inefficient water use and inequitable water distribution. While local elites can easily influence the institutional incentive structure in water supply and distribution, good partnerships between private sector entities, CBOs, and implementing agencies can deliver better results as demonstrated, for example, by the WSS system in Wairo community at Chakwal district in Punjab, Pakistan. The system requires that user charges are proportional to actual use (monitored by water meters) and that CBOs have a transparent accounting system.⁴²

Customer Interface

A non-comprehensive approach to water connection services results in inequitable provision of services to various customers. Comprehensive water connection programs should consider services for poorly served areas, businesses, and poor households. Maintenance, compliance, and enforcement need to be included in the program components, along with community education and awareness programs to better inform customers.⁴³ While provision of water services to customers depends to some extent on utilities' policy and regulations, a clear customer interface is required to raise awareness and understanding of service provisions, associated benefits and obligations, along with applicable policies and regulations.

Project-Level Risks

Project Design

Unrealistic and inappropriate project designs resulting from weak project preparatory analyses can seriously hamper implementation and jeopardize the short- and long-term impacts of projects. Enhancing project designs requires an in-depth analysis of demand and affordability of water supply services at the sector level, the findings of which should be considered part of the initial baseline survey.⁴⁴ The need for detailed assessment and sound analysis of supply and demand issues during project design was also echoed in two other completion reports and one special evaluation study.⁴⁵

Two reports identified the need for economic and financial analyses to be based on accurate and realistic assumptions, especially concerning tariffs, nonrevenue water, O&M expenditure, and water supply. Foreign exchange risks should also be adequately factored into the financial analysis and management of water companies, particularly when these entities face foreign debt service obligations.⁴⁶ Inaccurate assumptions or appraisal cost estimates based on inaccurate standard unit rates can undermine the project design and operation.⁴⁷ Understanding these risks at the organizational and operational levels is equally important.

Aside from incorporating demand, supply, economic, and financial analyses in project designs, strengthening risk analysis to enhance remedies and mitigation strategies was also identified in the evaluation of the urban services and WSS sector in Viet Nam.⁴⁸ Project designs should also consider and make use of experiences, good practices, and lessons identified from previous projects, including lessons from successful and efficient water utilities in the region—such as the case on reducing nonrevenue water.⁴⁹

To reinforce the effectiveness of enhanced WSS project designs, ADB should explore the possibility of reducing project start-up time. This can be done by ensuring timely recruitment of

implementation consultants, reviewing the feasibility studies (especially for the first year), and undertaking revisions in project scope and initial design during project preparation rather than during implementation.⁵⁰ Project implementation periods should be carefully examined and determined during appraisal, taking into account government regulations for detailed design and bidding, bid evaluation, and scope changes.⁵¹

Management and Implementation

Difficulties in the approval process due to the existence of many layers in processing affect implementation and the achievement of outputs and outcomes. For example, in Indonesia, a project encountered difficulties due to the many layers of government requirements and approvals. The project was implemented under the new decentralized form of government, which allows financing of urban infrastructure projects with official development assistance. To avail of the ADB loan, its subproject selection, approval, and funding flow had to undergo layers of processing not only in the local government but also in many ministries of the central government. As excessive bureaucratic requirements can hamper project implementation, in cases where loan funds must undergo layers of processing before approvals, the process could perhaps be streamlined by identifying and adopting specific criteria, indicators, and harmonized checkpoints, without compromising the need for internal controls.⁵²

Poor coordination due to the involvement of different departments slows down implementation. There are many ways to improve coordination for smooth project implementation, depending on the operating environment and its contexts. Illustrative examples show that coordination can be improved by (i) seconding staff from all involved departments to the central project management unit;⁵³ (ii) assigning one senior person responsible for program management, critical path monitoring, and risk management;⁵⁴ and (iii) strengthening project coordination and management skills at the subnational level (if subprojects are geographically dispersed).⁵⁵

Monitoring and Evaluation

Weak performance monitoring and evaluation systems can jeopardize opportunities for a better-informed management of water supply projects. For example, in the Fuzhou Water Supply and Wastewater Treatment Project in the People's Republic of China, the benefits of project performance monitoring and management evaluation were not fully appreciated by the government and executing agencies. The agencies felt that the information requested by ADB was not directly relevant to operations and day-to-day decision making, hence, were not willing to spend resources to collect the required data. There is therefore a need for more policy dialogues with the government and project staff on preparing practical and functional project performance and management evaluation systems.⁵⁶ The need to collect and maintain various project data was affirmed in two other evaluation reports while the use of the processed data to monitor improvements that social infrastructure projects are expected to yield was also emphasized.⁵⁷

Risk analysis is another feature in the performance monitoring system that should be added. For purposes of evaluation, project targets should be logically linked to project activities, and methods to monitor and verify the achievement of these targets should be based on indicators that can be reliably measured at an appropriate scale. Risks that occur during project implementation can also be monitored, along with measures taken to mitigate these

risks.⁵⁸ Timing is important in establishing a monitoring and evaluation system. For example, in the case of the Karachi Sewerage Project in Pakistan, the benefits monitoring and evaluation system was established too late in the project cycle. An executing agency's capacity to establish a monitoring and evaluation system or any other project performance monitoring system should be assessed during the project preparation stage.⁵⁹

Absence of a post-completion monitoring and evaluation process exposes the operations of water supply projects to uncertainties and failures. A rigorous impact evaluation and a post-completion evaluation process can provide more reliable quantitative impact estimates than conventional evaluations. An important characteristic of rigorous impact evaluation is the identification of a valid counterfactual simulation against which the treated group is compared. A rigorous impact evaluation permits disaggregated analysis and assists in explaining the specific contexts of impact (qualified impact) in quantitative terms. A good rigorous impact evaluation must be conducted by an independent party with active stakeholder participation and reliable data quality so that meaningful conclusions and implications can be drawn.⁶⁰

Sustainability

Lack of key stakeholders' commitment to water supply projects can seriously impair the overall and long-term sustainability of investments. Officials at the national and district levels, and participating partners should be involved and committed to the WSS projects early on. A sense of ownership and responsibility among the stakeholders should be encouraged for the success and sustainability of WSS projects. For example, if key partners are involved in all aspects of development, implementation, and O&M, their commitment and sense of ownership are enhanced.⁶¹

Complexity of infrastructure and operation systems can jeopardize the sustainability of water supply projects. Simple infrastructure, robust materials, and low O&M requirements promote sustainable service delivery. For example, in the constant-flow water supply system, households are supplied piped water through 500-liter elevated tanks using a flow-restricting device—between 200 and 500 liters per day. A public utilities board is responsible for adjusting this flow. However, this system had only been partially effective because of the added complexity, cost, O&M needs, and more opportunities for user abuse.⁶²

Lack of technical, managerial, and financial capacities of CBOs imperil the success and sustainability of community-led water supply interventions. The experience of Punjab, Pakistan in WSS projects showed that CBOs are instrumental to the success of community-led development interventions and that the functional maturity of CBOs is strongly correlated with the success of WSS interventions. If warranted, the capacities of CBOs must be strengthened to address technical, managerial, and financial management issues of water supply operations.⁶³

Summary and Conclusions

Risks that can impair ADB's development effectiveness in the urban water supply sector are multidimensional. This highlights the sector's vulnerability to risks in the absence of appropriate mitigating measures. Such risks can emanate from (i) capacity weaknesses in policy making, regulation, partnerships, sector planning, and management; (ii) unresponsive systems (water resource management, financial management, and procurement); (iii) poor governance, which hampers stakeholder participation, transparency, and accountability; and (iv) weak project design, management, and evaluation, among others. Financial management systems and operating environment that are unable to provide returns on invested capital and adequate revenue streams for facility maintenance can seriously undermine new investments, jeopardize service quality, and threaten the viability of sector operations. Lack of stakeholder commitment to sector improvements can also seriously compromise sustainability. Overall, fragile links in the chain of policy, planning, financial management, project management, and results-based evaluation can work against development effectiveness.

Various lessons drawn from the experience of ADB in the urban water supply sector call attention to the diversity and varying complexity of risks, along with measures pursued by various DMCs to address these risks. A careful understanding of the risk environment is a must, with due regard to specific contexts in which risks occur, the arrangements that can mitigate these risks, and the extent to which stakeholders and stakeholder alliances can affect policy, planning, and implementation processes. Where sector reforms are required, assessing roadblocks to collaboration as well as potential areas for engagement is crucial. Differences in stakeholder responses and the interplay of institutional, organizational, and capacity-related factors often shape development outcomes.

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Learning Lessons

Urban Water Supply Sector

This edition of *Learning Lessons* illustrates how lessons from evaluation can augment ongoing efforts for mitigating risks in the urban water supply sector at the institutional, organizational, operational, and project levels. It also aims to enhance development effectiveness of ADB assistance in the sector. Evaluation lessons are drawn from actual independent evaluation, self-evaluation, and the Evaluation Information System. Users of this brief are advised to carefully review these lessons in the context of the conditions and operating environments that they actually encounter for broadening their understanding of past ADB experience in the sector and the relevance of these lessons to current and future challenges.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.8 billion people who live on less than \$2 a day, with 903 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

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